ON THE PROGNOSIS OF "RAILWAY SPINE."

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On the Prognosis of "Railway Spine."*

By F. X. DERCUM, M. D., Philadelphia,

Clinical Professor of Diseases of the Nervous System, Jefferson Medical College; Neurologist to Philadelphia Hospital.

A QUESTION invariably asked the expert in suits for damages in cases of railway injuries is, "Will this patient recover? and if so, how long in your judgment will it be before recovery takes place?" I know of no question put to expert witnesses which is, as a rule, more difficult to answer, and regarding which there is often such a variance of opinions. My experience does not accord with those who claim that the symptoms in a given case disappear with the award for damages. That buoyancy and exaltation sometimes follow a successful issue of the trial, and that the symptoms of mental depression, so frequently present, disappear for a time at least, cannot be denied. However, if the case be watched, it will be found that long after the trial with its excitement has passed away that the ordinary symptoms of the case persist. I have often been asked as to what treatment I would recommend for a given case, and have merely been able to answer in a general way that rest, tonics, freedom from care, would produce favorable results in time; that if the patient could be submitted to a prolonged rest-cure possibly recovery might be assured, or might take place more rapidly. A lack of opportunity to test the latter method of treatment has heretofore prevented me from giving a more definite answer. Recently, however, the opportunity presented itself. In order that there should be no question regarding the character of the case—in order that there should be no doubt or quibble regarding simulation, or improper motives of any kind, I selected for the experiment a

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case typical in character and in which there was no suit for damages.

Before relating it in detail I will pass briefly over the method of diagnosis pursued by myself in cases of this kind, and which I have already published in a paper upon, "The Back in Railway Spine."* The underlying principle of the method is to exclude as far as possible simulation or exaggeration of symptoms by the patient.

As is well known the vast majority of these cases suffer from injuries to the trunk, more especially to the back. It is the back to which our attention is almost always called, even when there are injuries to the head or injuries to the limbs. With the patient standing, or if too weak, seated, with the trunk exposed and the back turned toward the physician, the following tests are applied:

After a rapid glance at the position in which the back is held, at the relative amount of curvature, at the differences in level of the two shoulders, at the presence or absence of muscular tremors, the following tests are performed:

First, palpation. The hand being placed slightly upon the back the patient may or may not shrink. This symptom of itself counts for very little. It may indicate either the presence of a genuine hyperæsthesia, or of a disposition to simulation. If hyperæsthesia be present it is probable that we will find hysteroid symptoms as we proceed to study the case. The symptom by itself, however, as already stated, is of little value.

The second test is by pressure. This I divide into superficial and deep pressure. My method of applying superficial pressure is as follows: I pass the finger-tips, or the palmar aspect of the thumb gently down over the spinal column, being careful to exert but a slight degree of pressure. As is well-known this test elicits in certain cases a flinching or other reaction as though pain were experienced, especially when we press over an area in

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the lower cervical, mid-dorsal region, over the dorso-lumbar juncture, the lumbar region itself, or over the end of the coccyx. The significance of this symptom I will not dwell upon now, but it is one which we all know is very commonly found in neurasthenia, especially in that form known as spinal irritation, and, also in hysteria when the latter affection complicates neurasthenia. The next test is deep pressure. I now press the palmar aspect of the thumb with some degree of force upon various regions of the spine, and also over the adjacent muscles and various other portions of the back. If deep-seated soreness be present, as I have before pointed out, the patient is apt to react less suddenly then he does if simply a tender spot is touched by superficial pressure, or if there be general hyperæsthenia of the back. The soreness, if present, elicited by deep pressure, is also more diffuse, and instead of being found directly over the spine of the vertebræ is apt to be found diffused for some little distance over one or both sides. Or it may be found over the muscles in various other portions of the back.

Another test which I occasionally employ is the test by percussion. It is one of the tests that I employ when no reaction results from deep or superficial pressure, and is performed by striking with a small rubber hammer, the patient lying upon his face, a number of very rapid, though not hard blows over the spine of the vertebræ, the idea being to elicit pain not by force of the blows, but by the faint but decided jarring produced.

We now come to the test by motion. This also consists of two portions; first, the test by voluntary motion; and, second, the test by passive motion. The patient is first directed to bend forward, his back being toward the observer. The manner in which the act is performed, the amount of the motion, the stage in the act of which the patient complains of pain, the area to which this pain is referred, and finally the occurrence of muscular spasm or

rigidity should be noted. Next the patient is requested to flex the trunk to the right or to the left, and here again the character of the motion and the action of the muscles is studied. If no symptoms be elicited or if they be of doubtful character, the operator may forcibly flex the trunk to the right or to the left, the patient not being warned beforehand of what the operator is about to do. As a rule this test is unnecessary. However, the following test I regard as very important in certain cases. This is the test by forcible rotation. An assistant, kneeling before the patient, should firmly grasp the hips, while the operator, seizing the shoulders, should gently but firmly rotate the upper half of the trunk. If there be deep-seated soreness the patient will at once give signs of suffering. As I have before pointed out, this method of searching for pain is a powerful one and is only required in exceptional instances. Its special application and significance I will not pause to point out.

Next comes the test by transmitted shock. This I have also previously described. It may be practiced in various ways. The patient standing as erect as possible, the operator places both hands with fingers interlocked upon the head of the patient and then by a sudden downward pull sends an impulse through the spine. The amount of force exerted must be guided by the reaction of the patient. The spine may be so very sore that the reaction to even a slight impulse is excessive and needless suffering caused; a gentle pull should at first be given and if no response is elicited a more forcible one may be made. If it be desired to eliminate the cervical portion of the spine from the problem, the patient may be seated and the impulse be transmitted through the shoulders.

A third method is to direct the patient, if standing, to raise himself upon the toes and then to let himself fall back heavily upon the heels. This method is less valuable than the others, for a man with a very sore back can absolutely not be made to execute this test

properly. At most it should be used as a confirmation of pain doubtfully elicited by other means. I will not spend time in alluding to the various expedients, like the "double touch" for detecting malingering, nor will I recite the general methods pursued in studying the various subjective symptoms present in these cases. The above tests that I have rehearsed apply of course to the *physical condition of the back only*, and help us in the formation of an opinion as to whether there is or is not an injury to the vertebral column, ligaments, the muscles, or other structures. It is not of course necessary to detail here the methods pursued in searching for actual lesions of the spinal contents. In my own experience, lesions of the spinal contents in "railway spine" are rare and furthermore they were not present in the case which I am about to detail. The case is as follows (its early history was in part reported in the paper already alluded to):

B. W., aged 42, married, carpenter and builder by trade, presented himself at the University Hospital, December 5th, 1890. On the 17th of June of the same year, while erecting a barn, he had been struck by a large rafter in the middle of the back, knocking him down and pinning him to the earth. He was unconscious for a few minutes and later he was sick at his stomach. Vomiting recurred repeatedly during the next four days, the vomit occasionally containing blood. During this time he was not confined to the house, but continued outside directing his men at their work. He said, however, that he felt giddy and was afraid to climb to a height. His back, too, felt quite sore. About a week after the accident he began to be troubled with headache, while the giddiness became more and more marked. The soreness now spread all along his spine. His physician, who accompanied him to the hospital, said that pressure upon the spine now made him sick at the stomach, and also caused his face to flush. He was obliged to remain indoors; he was unable to collect his thoughts; could not concentrate his attention upon anything; slept badly at night; was restless and delirious. He had also become very weak.

On stripping the man, it was noticed that he held his back very stiffly, and further that there was a marked tremor apparently of all the muscles of the back. Lightly placing the hand upon the back caused flinching. Superficial pressure was now made over the vertebral spines. It was found that the patient flinched slightly as the thumb passed over the upper and the mid-dorsal regions. Deep and persistent pressure was next made on either side of the spinal gutter over the muscles of the small of the back and adjacent regions. The patient now reacted in such a manner as to convince us that these muscles were exquisitely sore. Tested by motion it was found that the forward flexion, in fact, movement in any direction, was accompanied by excessive pain and, further, by an objective symptom of great value, namely excessive spasm of the muscles. In consequence the movements were limited in extent. On attempting forcible flexion, spasm and pain were both grossly exaggerated. Transmitted shock elicited pain in the upper and mid-dorsal regions.

The knee-jerks were excessively exaggerated. Ankle clonus was present on both sides. There was also paroxysmal contraction of the tibialis anticus, sweating so excessive that it saturated his clothing; and there was also occasional flushing of the face. In addition, the patient presented various subjective nervous and mental symptoms suggestive both of hysteria and of neurasthenia. I learned afterwards from his wife that in August of 1890, some two months after the accident, he had had a convulsion. He had been growing steadily worse and less and less able to attend to his business. The convulsion came on at night and was repeated for a number of nights consecutively. They are described by the wife as follows: The convulsions usually came on at midnight, lasting until about six o'clock the next morning. They consisted of a series of paroxysms which followed each other at intervals of from five to ten minutes. The patient seemed to be entirely conscious during them. He would throw out his arms, throw back his head, roll up his eyes and stiffen his limbs. Towards morning he would fall asleep and would wake up all right again. He finally grew so bad that he remained in bed continuously for about two and a half weeks, and then went to bed, off and on, until his visit to the University. He was delirious nearly every night during this time. He would have

spasms, talk very much about the accident, and seemed to be constantly afraid of falling, and of being hurt.

From the physicial examination it was evident that the man had had a severe injury to the back. This doubtless consisted of a bruising and wrenching of the muscles and the muscular insertions. From the excessive pain present upon flexion and also upon transmitted shock it is very probable that the ligaments of the spinal column had also been strained. In addition he was excessively neurasthenic, and beyond a doubt the convulsions so ably described by his wife were hysterical in character. The case was thus a mixture of physical and subjective or psychic symptoms, and it may be looked upon as an exact counterpart of cases which every day appear as claimants for damages from railway accidents. It therefore suggested itself as an excellent one in which to test the resources of the rest-cure. However, neither opportunity nor the patient's means permitted the carrying out of my suggestion at this time. The man went home, and spent his time in and out of bed, improving a little now and then in proportion as he remained in bed, and presenting at the end of another year little or no change. He was now, January 12, 1892, admitted under my care to the wards of the Orthopedic Hospital and Infirmary for Nervous Disease (Dr. Weir-Mitchell having kindly granted me the privilege of one of his beds). His condition at that time was as follows: General fibrillary tremor of the muscles of the back and to some extent of the muscles of the arms. This tremor slightly increased on voluntary motion. There was also present excessive sweating, the surface of the trunk being decidedly wet. The back was exceedingly sensitive to pressure in the upper and mid-dorsal regions. The muscles to either side the spinal gutter were very sore. Forward flexion of the trunk provoked muscular spasm most marked in erector spinæ group. Lateral flexion produced a similar spasm. Transmitted shock elicited pain in the upper and mid-dorsal regions. All reflexes were exaggerated. Station fairly good; no bladder or bowel symptom. In addition there was present tremor of the hands and of the tongue. The hands were livid, moist and cold. His weight at the time of the accident was 147 pounds, he now weighed 129 pounds. He was, further, exceedingly weak, nervous and depressed,

and suffered greatly from insomnia. He complained also of dreaming of the accident over and over again, and dreamt constantly of falling off of buildings. His wife now told us that in September of 1891, he had a return of his convulsions, and it took at times several men to hold him; that he was conscious as the attacks were coming on and as they were passing off; that he talked a great deal about having lost a piece from his forehead, asking each person who came to see him, to try to find it, as his mind would never be right again until it was found; that he also cried a great deal, complained greatly of headache and talked continuously about putting himself out of the way.

At the time of his admission to the Orthopedic Hospital no symptoms of delirium presented themselves. The man was placed in bed absolutely at rest and absolute seclusion was practiced as regards his relatives and friends. Systematic diet, in which milk played a large part, was now adopted and massage instituted. Later on the slowly interrupted faradic current was also used. Improvement was very slow at first, no change being perceptible for several weeks. However, little by little, a gain in weight was observed, and hand-in-hand with this also an improvement in the neurasthenic and hysterical symptoms. The back, however, remained painful to a very great degree. In the first few weeks following his admission he had several hysterical convulsions; later on these ceased altogether. His general condition continued steadily to improve, but the deep-seated pain and soreness in the back persisting, the treatment was prolonged week after week and month after month, in the hope of finally subduing it. At length it began to yield, but did not leave him entirely. However, on June 25th, 1892, after over five and a half months of rest in bed, he was discharged almost but not entirely well. His weight had increased from 129 pounds to 157½ pounds. At the time of discharge, his condition was briefly as follows: No fibrillary tremors present anywhere, no tremors of the arms or hands or any part of the body. Could flex the trunk, but it was still somewhat stiff and slight pain was still present. Any attempt at marked flexion still evoked slight spasm of the muscles. Did not sweat while standing still, but slight exertion or even mental excitement brought it on. His nervousness had practically all disappeared. He slept well and no longer dreamt at night.

He said that he felt now as though he could work—in fact, that he felt now for the first time since the accident like "pitching in." This certainly suggested a marked return of energy. I impressed upon him, however, the importance of not doing a full amount of work at once, but of keeping up a partial rest-cure at home. He did so, but, notwithstanding, had a return of a number of mild hystero-epileptic seizures this spring. However, a letter, dated June 22d, 1893, tells me that he is well, with the exception of a slight soreness in his back.

The above case I believe to be extremely valuable from a medico-legal point of view, not only because of the absence of all element of litigation, but because it throws considerable light upon the prognosis in this class of cases. It will be observed that before the patient was placed under systematic treatment he failed to improve. He remained practically in an unchanged condition, and it was not until systematic and an unusually prolonged course of "rest-cure" treatment was instituted that improvement finally took place. This man, further, had every possible motive to get well. His business and family suffered greatly by his absence. His worry from this source was very great. However, he now tells me that he is again actively at work at his occupation of builder. I should add, though, that none of the manual work is done by himself.

In previous papers* I have described cases without litigation, in which little or no improvement occurred even after the lapse of years. The only case in which I have had an opportunity of testing the effects of treatment was one in which the back symptoms were similar though the hysterical symptoms were absent. In this case, although rest in bed, massage, and even a plaster-jacket were at various times instituted, and the treatment extended variously over two years, little or no improvement ensued.

However, it must be admitted that it had not been pos-

* "Remarks on Spinal Injuries."—*Therapeutic Gazette*, May 15th, 1889. "The Back in Railway Spine."—*American Journal of Medical Sciences*, September, 1891.

sible at any time to institute a systematic course of rest-cure. I am strongly inclined, however, to believe that in this instance it would have availed but little, and would not have influenced the chronic character of the case.* There are, of course, many cases in which tremor and spasm of the muscles of the back are not present or are concealed by the superficial fat. In these, flexion, deep pressure and transmitted shock, nevertheless, demonstrate the injury to the muscle insertions, ligaments and other structures.

We now consider in how far are we assisted by the experience I have detailed in answering the question, "Will the claimant recover? and if so, how long will it be before he recovers?" I have sometimes answered this question by saying frankly that I did not know. I was then asked by the Court to use my best judgment and say how long it would take under the most favorable conditions for the patient to recover. Under the most favorable conditions, generally implies a method of treatment which is not in vogue in general hospitals, which is rarely carried out as it should be in private practice, and which it is difficult to obtain, except at special hospitals. This, I think, should be made clear in the answer of the expert when he answers that under the most favorable conditions, that is by prolonged rest-cure, the patient will markedly improve in about six months, but that complete recovery, if it take place at all, will not ensue for several years.

It must be borne in mind, further, that there are some cases of such great severity that probably no improvement will take place under any conditions, and also that there are others again very much milder in whom improvement takes place rapidly. Of course, the answers must be adapted to each case.

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* For a detailed report of this case, reader is referred to the paper, "A Case of Railway Back," *Journal of Nervous and Mental Diseases*, 1892.